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EXAMINER	
LIU, SUE XU	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/522,037	NALIN ET AL.	
	Examiner	Art Unit	
	SUE LIU	1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *24-27,31,32,34-40,42 and 47-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-27, 31, 32, 34-40, 42 and 47-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Status

1. Claims 1-23, 28-30, 33, 41 and 43-46 have been cancelled.

2. Claims 48 and 49 have been added.

Claims 24-27, 31, 32, 34-40, 42 and 47-49 are currently pending.

Claims 24-27, 31, 32, 34-40, 42 and 47-49 are being examined in this application.

Election/Restrictions

3. Applicant's election with traverse of Group I (claims 24-42 and 47) in the reply filed on 4/16/07 is as previously acknowledged.

4. The newly added claims 48 and 49 are grouped with the previously elected Group I invention.

Priority

5. This application is filed under 35 U.S.C 371 of PCT/EP03/07765 (filed on 07/17/2003).

6. Receipt is as previously acknowledged of papers (EP 022918718; 7/24/02) submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objection(s) / Rejection(s) Withdrawn

7. In light of applicants' amendments to the claims and supporting arguments, the objection against Claims 24, 38 and 42 in the previous office action is withdrawn.

Claim Objection(s) / Rejection(s) Maintained

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Rondon, Chain, Groth, Berg and Devine

9. Claims 24-27, 31, 32, 34-40, 42 and 47-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rondon et al (Applied and Environmental Microbiology. Vol. 66(6): 2541-2547; 06/2000; cited in IDS), in view of Chain et al (Journal of Bacteriology. Vol.182: 5486-5494; 10/2000), Groth et al (PNAS. Vol.97: 5995-6100; 2000), Berg et al (PNAS. Vol.79: 2632-2635; 1982), and if necessary in view of Devine et al (US 5,728,551; 3/17/1998). The previous rejection over claims 24-27, 31, 32, 34-40, 42 and 47 is maintained for the reasons of record as set forth in the previous Office action as well as for the reasons below. The rejection over claims 48 and 49 is necessitated by applicant's amendment to the claims.

The instant claims recite "A method of analysing a library of polynucleotides, said polynucleotides being contained in cloning vectors having a particular host range, the method comprising (i) selecting cloning vectors in the library… (ii) inserting a target polnycleotide construct… (iii) transferring said modified cloning vectors… in… host cell… (iv) analysing the polynucleotide…"

Rondon et al, throughout the publication, teach molecular cloning of DNA isolated from microbial samples using various cloning vectors (Abstract).

The reference teaches construction BAC (bacterial artificial chromosome) libraries made with DNA isolated directly from soil (e.g. p.2541, right col., para 2; p.2542, left col., para 1-2), which read on step (i) of **clm 42** as well as the unknown polynucleotides of **clms 25** and **26**, as well as the BAC vector of **clm 47**. The reference also teaches screening and analyzing the clones from the generated libraries (e.g. pp.2542-2543; especially bridging para) and selection of a certain constructs such as the constructs that contain various genes (including cellulose, chitinase, keratinase, etc.) (e.g. p.2543), as well as "selecting" DNA with certain size from the generated libraries (e.g. p.2542, left col., para 3), which read on the "selecting step" of **clms 24** (step (i)) and **42** (step (ii)), as well as **clm 39**. The reference also teaches restriction digestion of the selected vectors, and then subsequent ligation and transformation of the selected DNA (e.g. p.2542, cols, 1-2), which reads on the "transferring" and "cloning" steps of **clms 24** (step (iii)) and **42** (step (iv)).

The reference inherently teaches "integration… into a chromosome of a selected host cell" of step (iii) of **clms 24** and step (iv) of **42.** The reference teaches mutating BAC (i.e. chromosome) of host cells (e.g. p.2541, last para; p.2542, right col., para 5; pp.2452+) as

described in a related publication, Rondon et al (PNAS. Vol.96: 6451-6455; 1999), which the "integration" (or transposon mutagensis) procedure of Rondon (2000) is the carried out the same as the one in Rondon (1999). The Rondon (1999) publication teaches transforming BAC containing host cells (i.e. "chromosome" containing host cells) with plasmids (or DNA vectors) for transposon mutations (e.g. pp.6452-6453 of Rondon (1999)). Thus, by using the transposon mutagensis procedure, one of the host cell "chromosome" (i.e. the transformed BAC) is integrated with "the polynucleotide" from the inserted cloning vector.

The reference also teaches sequencing the cloning vector as well analyze the encoded proteins (e.g. p.2542), which read on the last step of **clms 24** and **42**.

The reference teaches using various *E. coli* cloning vectors (e.g. pp.2541-2542), which reads on the vectors of **clm 27**.

The reference also inherently teaches the cloning vectors to have at least a promoter region as recited in **clm 35**, because the cloned DNA fragments are successfully expressed (e.g. pp.2542-2543) indicating a promoter region for transcriptional gene expression activation.

Rondon et al do not explicitly teach the "a target polynucleotide construct" comprising "origin of transfer" and an "integrase functional" as recited in step (ii) of **clm 24** and step (iii) of **clm 42**. The reference also does not explicitly teaches the target polynucleotide construct comprises the "origin of transfer functional" as recited in **clms 31** and **32**, as well as the inherent function of conjugative transfer as recited in **clm 40**. The abbreviation, RP4 recited in **clm 32** is construed as referring to the bacterial plasmid RP4. The reference also does not explicitly teach the specific integrase recited in **clm 34**. The reference also does not explicitly teach the target polynucleotide construct is contained in a "transposable nucleic acids" as well as using

"transposase" for cloning vector modification as recited in **clms 36-38**. The reference also does not explicitly teach the host cell has a "genomic distinct from E. coli" as recited in **clms 48** and **49**.

However, **Chain** et al, throughout the publication, teach inserting oriT from RK2 (equivalent to RP4) into cloning vectors for site specific recombination of fragments of bacteria genomic DNA isolated from environment (such as soil) (e.g. Abstract; p.5484, Figures 1-2), which read on the origin of transfer (RP4) as recited in **clms 31** and **32**. The reference also inherently teaches "conjugative transfer" recited in **clm 40**, because "conjugative transfer" is an inherent property or a "natural DNA transfer mechanism" of constructs comprising "origin of transfer" (such as oriT from RP4) as evidenced by the instant specification (instant spec. p.14, lines 25+). In addition, the Chain reference also teaches the inherent property of conjugative transfer of the oriT element (Chain, p.5486, right col., para 2; p.5491, right col., para 1). The Chain reference also teaches the oriT is inserted in a position that is "distinct" from other inserted DNA fragments (e.g. Figure 1), which reads on the "distinct" insertion as recited in step (ii) of **clm 24** as well as step (iii) of **clm 42**.

Groth et al, throughout the publication, teach inserting using phage C31 integrase to carry out recombination between DNA or interest and bacterial chromosome or human DNA (e.g. Abstract; pp.5995-5996), which reads on the phage C31 integrase of **clm 34**. The reference also teaches using human cells as host cells (e.g. Abstract), which reads on the host cells of **clms 48** and **49**. The reference also teaches the advantages of using host cells such as human cells (that is distinct from the E. coli cells) so that a broad range of genetic engineering applications can be carried out (e.g. Abstract).

Berg et al, throughout the publication, teach inserting using transposon elements for modifying DNA constructs (Abstract). The reference teaches the transposon DNA comprising inverted repeats, and marker gene such as Kan resistance gene (e.g. Figures 1-2). The reference also teaches using transposase for the DNA recombination process (e.g. p.2632, para 1; pp.2633-2634, bridging para). The reference also teaches inverse transposition where the Kan resistance gene is replaced by other drug resistance genes (e.g. Figure 2), which read on the reagents and/or method steps of replacing the first marker gene with the second marker gene as recited in **clms 36-38**. The reference also teaches the advantages of using transposons such as their ability to recombine DNA without needing extensive DNA homology (e.g. p.2632, para 1).

Devine et al, throughout the patent, teach using transposons (with transposase) to facilitate DNA recombinant events (Abstract). The reference also teaches the advantages of "in vitro" transposon reactions such as high efficiency and versatility of the method (e.g. col. 5, lines 45+).

Therefore, it would have been prima facie obvious for one of ordinary skill in the art at the time the invention was made to insert "oriT" derived from RP4 or other plasmid into cloning vectors through the "natural DNA transfer mechanism" as well as inserting an integrase coding gene (such as phage C31 integrase) for the purpose of integrating the desired DNA into the host cell genome. It would also have been prima facie obvious for one of ordinary skill in the art at the time the invention was made to use transposon with transposase for desired DNA recombination such as insertion, deletion or mutation of DNA constructs in an in vitro or in vivo process.

A person of ordinary skill in the art would have been motivated at the time of the invention to insert oriT (or the origin of transfer) from RP4 plasmid in cloning or expression vectors, because utilization of these oriT DNA fragments offers the advantages of specific site direct insertion of large fragments from bacteria genome to host E. coli genome as taught by Chain et al (e.g. Abstract). It would have been obvious to one of ordinary skill in the art to apply the standard technique of addition of an origin of transfer in cloning vectors such as taught by Chain et al, to improve the vector system for the predicable result of enabling standard DNA cloning and recombination.

A person of ordinary skill in the art would have been motivated at the time of the invention to include nucleic acids encoding for the phage C31 integrase in the cloning or expression vector for the purpose of integrating the desired DNA, because utilization of integrase offers the advantages of "precise unidirectional integration" with high efficiency as taught by Groth et al (e.g. Abstract). It would have been obvious to one of ordinary skill in the art to apply the standard technique of addition of an integrase encoding gene in cloning vectors such as taught by Groth et al, to improve the vector system for the predicable result of enabling standard DNA cloning and recombination especially for integration into the cellular chromosome.

A person of ordinary skill in the art would have been motivated at the time of the invention to use transposons with transposase for either in vivo or in vitro recombining DNA to generate desired DNA constructs, because utilization of transposons/transposase especially in an in vitro process offers the advantages of DNA recombination without requiring DNA homology as taught by Berg et al, and high efficiency in an in vitro process as taught by Devine et al discussed above. It would have been obvious to one of ordinary skill in the art to apply the

standard technique of addition of using transposons with transposases for recombining DNA such as taught by Berg and Devine, to improve the in vitro DNA recombining process for the predicable result of enabling standard DNA cloning and recombination.

A person of ordinary skill in the art would have been motivated at the time of the invention to use cells that are distinct from E. coli as host cells, because Groth et al. teach the advantages of using other host cells (such as human cells) so that a broad range of genetic applications can be carried out. In addition, because the cited references (such as Haldimann and Groth) teach methods of cloning using integrase function in various cells, it would have been obvious to one skilled in the art to substitute one host cell for the other to achieve the predictable result of cloning DNA of interest using known and routine molecular cloning technologies.

A person of ordinary skill in the art would have reasonable expectation of success of achieving such modifications since Rondon et al, Chain et al and Groth et al have demonstrated manipulation of various cloning vectors for insertion of desired DNA fragments such as oriT, phage C31 integrase, nucleic acid fragment of interest, and host cell transformation as well as conjugative transfer are routine and known in the art and have shown to be successfully used for various molecular cloning processes. In addition, Rondon et al, Chain et al, Groth et al, Berg et al and Devine have demonstrated manipulation of various cloning vectors for insertion of desired DNA fragments using various elements such as transposons are routine and known in the art and have shown to be successfully used for various molecular cloning processes.

Discussion and Answer to Argument

10. Applicant's arguments have been fully considered but they are not persuasive for the following reasons (in addition to reasons of record). Each point of applicant's traversal is addressed below (applicant's arguments are in italic):

All applicants' argument regarding the claim rejections under 35 USC 103(a) are answered and discussed below.

In general, applicants traversed the above rejections by attacking each reference alone (Reply, pp.11+). In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicants assert "the Examiner has impermissibly combined elements without any regard to their established function in the prior art, in contravention of the guidance provided in KSR…". (Reply, p.7).

It is not clear how the elements were allegedly combined "without any regard to their established function in the prior art". As discussed above and previously, the above rejection is over a combination of references, and not just over the Rondon reference alone. Applicant's assertion of the BAC vector cannot be used as both a vector as well as a chromosome is without factual support. Contrary to applicant's assertion, the BAC can be used as both a vector as well as a chromosome within bacteria. The instant claims (e.g. Claim 24) do not require that the inserted vector and the chromosome be different entities. The instant specification also does not

specifically define that a chromosome cannot be BAC (i.e. bacterial artificial chromosome). In addition, as discussed supra, the Rondon reference inherently teaches using a vector (other than BAC) to integrate a desired DNA into BAC of its host cells (see above discussion regarding the Rondon (PNAS. Vol.96: 6451-6455; 1999) reference. Assuming, *Arguendo*, the instant claims can be interpreted to mean the cloning vector and the chromosome must be different entities, the Rondon reference (PNAS 1999), as discussed above, teaches transforming BAC containing host cells (i.e. "chromosome" containing host cells) with plasmids (or DNA vectors) for transposon mutations (e.g. pp.6452-6453 of Rondon (1999)). That is the plasmid vectors are different from the BAC (i.e. chromosomes) of the host bacterial cells.

Applicants also argue the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose. (Reply, p.7).

However, applicants have not provided any factual evidence to support this assertion. As discussed above, the Rondon reference inherently teaches using DNA vectors to integrate DNA of interest into a "chromosome". It is also not clear how the "modification" would render the intended purpose of the Rondon reference (i.e. cloning isolated DNAs using various cloning vectors as well as molecular technologlies) unsatisfactory.

Applicants also assert "a person of ordinary skill in the art would not have been motivated to modify a vector containing a polynucleotide of interest..." (Reply, p.8).

Applicant's made the above assertion without providing any supporting evidence. "The arguments of counsel cannot take the place of evidence in the record. In re Schulze, 346 F.2d

600, 602, 145 USPQ 716, 718 (CCPA 1965). Examples of attorney statements which are not evidence and which must be supported by an appropriate affidavit or declaration include statements regarding unexpected results, commercial success, solution of a long-felt need, inoperability of the prior art, invention before the date of the reference, and allegations that the author(s) of the prior art derived the disclosed subject matter from the applicant." (MPEP 716.01(c) II)

Haldimann and Others

11. Claims 24-27, 31, 32, 34-40, 42 and 47-49 are rejected under **35 U.S.C. 102(b)** as being anticipated by Haldimann et al (Journal of Bacteriology. Vol. 183(21): 6384-6393; 11/2001), in view of Chain et al (Journal of Bacteriology. Vol.182: 5486-5494; 10/2000), Groth et al (PNAS. Vol.97: 5995-6100; 2000), Berg et al (PNAS. Vol.79: 2632-2635; 1982), and if necessary in view of Devine et al (US 5,728,551; 3/17/1998). The previous rejection over claims 24-27, 31, 32, 34-40, 42 and 47 is maintained for the reasons of record as set forth in the previous Office action as well as for the reasons below. The rejection over claims 48 and 49 is necessitated by applicant's amendment to the claims.

Haldimann et al, throughout the publication, teach molecular cloning of DNAs using various vectors into bacteria chromosomes (e.g. Abstract).

The reference teaches making vectors comprising libraries of various DNAs (genes or mutants of genes) (e.g. Abstract; p.6384; p.6391, right col.), which the various DNAs (or genes) read on "a library of polynucleotides" in cloning vectors of **clms 24** and **42**. The reference also teaches studying (or screening) the function of the library members (e.g. Abstract; p.6384, right

col.), which read on step (i) of **clm 24** and step (ii) **clm 42** and **clm 39**. The reference also teaches these cloning vectors allow transfer and integration of the genes into E. coli host cell chromosomes as well as the required and inserted integrase elements (such as attB sites) (e.g. p.6384; p.6389; Figures 3-4), which read on steps (ii-iii) of **clm 24** as well as steps (iii-iv) of **clm 42**. As the integrase elements are inserted at locations other than the inserted gene (e.g. Figure 4), which reads on the distinct insertion of **clms 24** and **42**. The reference also teaches analyzing the integrated DNAs (e.g. pp.6389+), which reads on step (iv) of **clm 24** as well as the last step of **clm 42**. The reference also teaches the plasmids comprising phage integrases (e.g. p.6384, left col.), which read on the integrase of **clms 24** and **42**.

The various DNA fragments of the reference also read on the "unknown polynucleotides" of **clm 25** because the term "unknown" broadly encompassing any polynucleotide. For example, a "known" polynucleotide to one entity can be an "unknown" polynucleotide" to another entity.

The cloning vectors of the reference (e.g. pp.6385+) read on the E. coli cloning vectors of **clm 27**.

The reference teaches various steps of constructing the plasmids including insertion (e.g. pp.6386+), which read on the targeted insertion of **clm 28.**

The reference also teaches the plasmids comprise various promoters (e.g. Abstract), which read on the promoters of **clm 35**.

Haldimann et al do not explicitly teach the "a target polynucleotide construct" comprising "origin of transfer" as recited in step (ii) of **clm 24** and step (iii) of **clm 42**. The reference also does not explicitly teach "environmental DNA fragments" as recited in **clm 26**. The reference also does not explicitly teaches the target polynucleotide construct comprises the

"origin of transfer functional" as recited in **clms 31** and **32**, as well as the inherent function of conjugative transfer as recited in **clm 40**. The abbreviation, RP4 recited in **clm 32** is construed as referring to the bacterial plasmid RP4. The reference also does not explicitly teach the specific integrase recited in **clm 34**. The reference also does not explicitly teach the target polynucleotide construct is contained in a "transposable nucleic acids" as well as using "transposase" for cloning vector modification as recited in **clms 36-38**. The reference also does not explicitly teaches using the cloning vector recited in **clm 47**. The reference also does not explicitly teach the host cell has a "genomic distinct from E. coli" as recited in **clms 48** and **49**.

However, **Chain** et al, throughout the publication, teach inserting oriT from RK2 (equivalent to RP4) into cloning vectors for site specific recombination of fragments of bacteria genomic DNA isolated from environment (such as soil) (e.g. Abstract; p.5484, Figures 1-2), which read on the origin of transfer (RP4) as recited in **clms 31** and **32** as well as the environmental DNA of **clm 26**. The reference also inherently teaches "conjugative transfer" recited in **clm 40**, because "conjugative transfer" is an inherent property or a "natural DNA transfer mechanism" of constructs comprising "origin of transfer" (such as oriT from RP4) as evidenced by the instant specification (instant spec. p.14, lines 25+). In addition, the Chain reference also teaches the inherent property of conjugative transfer of the oriT element (Chain, p.5486, right col., para 2; p.5491, right col., para 1). The Chain reference also teaches the oriT is inserted in a position that is "distinct" from other inserted DNA fragments (e.g. Figure 1), which reads on the "distinct" insertion as recited in step (ii) of **clm 24** as well as step (iii) of **clm 42**. The reference also teaches using BAC or cosmid cloning vectors are known and routine in the art (e.g. p.5492), which read on the vectors of **clm 47**.

Groth et al, throughout the publication, teach inserting using phage C31 integrase to carry out recombination between DNA or interest and bacterial chromosome or human DNA (e.g. Abstract; pp.5995-5996), which reads on the phage C31 integrase of **clm 34**. The reference also teaches using human cells as host cells (e.g. Abstract), which reads on the host cells of **clms 48** and **49**. The reference also teaches the advantages of using host cells such as human cells (that is distinct from the E. coli cells) so that a broad range of genetic engineering applications can be carried out (e.g. Abstract).

Berg et al, throughout the publication, teach inserting using transposon elements for modifying DNA constructs (Abstract). The reference teaches the transposon DNA comprising inverted repeats, and marker gene such as Kan resistance gene (e.g. Figures 1-2). The reference also teaches using transposase for the DNA recombination process (e.g. p.2632, para 1; pp.2633-2634, bridging para). The reference also teaches inverse transposition where the Kan resistance gene is replaced by other drug resistance genes (e.g. Figure 2), which read on the reagents and/or method steps of replacing the first marker gene with the second marker gene as recited in **clms 36-38**. The reference also teaches the advantages of using transposons such as their ability to recombine DNA without needing extensive DNA homology (e.g. p.2632, para 1).

Devine et al, throughout the patent, teach using transposons (with transposase) to facilitate DNA recombinant events (Abstract). The reference also teaches the advantages of "in vitro" transposon reactions such as high efficiency and versatility of the method (e.g. col. 5, lines 45+). The reference also teaches using cosmid vectors (e.g. col.19, lines 60+).

Therefore, it would have been prima facie obvious for one of ordinary skill in the art at the time the invention was made to insert "oriT" derived from RP4 or other plasmid into cloning

vectors through the "natural DNA transfer mechanism" as well as inserting an integrase coding gene (such as phage C31 integrase) for the purpose of integrating the desired DNA into the host cell genome. It would also have been prima facie obvious for one of ordinary skill in the art at the time the invention was made to use transposon with transposase for desired DNA recombination such as insertion, deletion or mutation of DNA constructs in an in vitro or in vivo process. I would also have been prima facie obvious for one of ordinary skill in the art at the time the invention was made to use various known vectors including BAC and cosmids.

A person of ordinary skill in the art would have been motivated at the time of the invention to insert oriT (or the origin of transfer) from RP4 plasmid in cloning or expression vectors, because utilization of these oriT DNA fragments offers the advantages of specific site direct insertion of large fragments from bacteria genome to host E. coli genome as taught by Chain et al (e.g. Abstract). It would have been obvious to one of ordinary skill in the art to apply the standard technique of addition of an origin of transfer in cloning vectors such as taught by Chain et al, to improve the vector system for the predicable result of enabling standard DNA cloning and recombination.

In addition, because both the Haldimann reference and Chain reference teach methods of using vectors to clone and studying DNA of interest for various purposes, it would have been obvious to one skilled in the art to substitute one nucleic acid of interest for the other (environmental DNA) to achieve the predictable result of expressing and/or selecting the DNA fragments of interest.

A person of ordinary skill in the art would have been motivated at the time of the invention to include nucleic acids encoding for the phage C31 integrase in the cloning or

expression vector for the purpose of integrating the desired DNA, because utilization of integrase offers the advantages of "precise unidirectional integration" with high efficiency as taught by Groth et al (e.g. Abstract). It would have been obvious to one of ordinary skill in the art to apply the standard technique of addition of an integrase encoding gene in cloning vectors such as taught by Groth et al, to improve the vector system for the predicable result of enabling standard DNA cloning and recombination especially for integration into the cellular chromosome.

A person of ordinary skill in the art would have been motivated at the time of the invention to use transposons with transposase for either in vivo or in vitro recombining DNA to generate desired DNA constructs, because utilization of transposons/transposase especially in an in vitro process offers the advantages of DNA recombination without requiring DNA homology as taught by Berg et al, and high efficiency in an in vitro process as taught by Devine et al discussed above. It would have been obvious to one of ordinary skill in the art to apply the standard technique of addition of using transposons with transposases for recombining DNA such as taught by Berg and Devine, to improve the in vitro DNA recombining process for the predicable result of enabling standard DNA cloning and recombination.

In addition, because the cited references (e.g. Haldimann, Chain and Devine) teach methods of using various expression/cloning vectors to clone various nucleic acids of interest for various purposes, it would have been obvious to one skilled in the art to substitute one cloning vector for the other (BAC or cosmidds) to achieve the predictable result of cloning/expressing the desired gene.

A person of ordinary skill in the art would have been motivated at the time of the invention to use cells that are distinct from E. coli as host cells, because Groth et al. teach the

advantages of using other host cells (such as human cells) so that a broad range of genetic applications can be carried out. In addition, because the cited references (such as Haldimann and Groth) teach methods of cloning using integrase function in various cells, it would have been obvious to one skilled in the art to substitute one host cell for the other to achieve the predictable result of cloning DNA of interest using known and routine molecular cloning technologies.

A person of ordinary skill in the art would have reasonable expectation of success of achieving such modifications since Rondon et al, Chain et al and Groth et al have demonstrated manipulation of various cloning vectors for insertion of desired DNA fragments such as oriT, phage C31 integrase, nucleic acid fragment of interest, and host cell transformation as well as conjugative transfer are routine and known in the art and have shown to be successfully used for various molecular cloning processes. In addition, Rondon et al, Chain et al, Groth et al, Berg et al and Devine have demonstrated manipulation of various cloning vectors for insertion of desired DNA fragments using various elements such as transposons are routine and known in the art and have shown to be successfully used for various molecular cloning processes.

Discussion and Answer to Argument

12. Applicant's arguments have been fully considered but they are not persuasive for the following reasons (in addition to reasons of record). Each point of applicant's traversal is addressed below (applicant's arguments are in italic):

Applicants assert the "neither this reference [Chain et al], nor any of the other cited references... provide any evidence that an oriT or integrase is present in the constructs of the Haldimann et al." and "Because Haldimann et al, does not expressly or inherently describe each

and every element set forth in any claim, Haldimann et al, cannot anticipate any claim." (Reply, p.8).

Again, applicants traversed the above rejections by attacking each reference alone (Reply, pp.8+). In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The above rejection is not over Haldimann reference alone, but over a combination of references. As discussed above and surpa, the Haldimann reference does not explicitly teach the "origin of transfer" and/or other elements. However, the other cited references teach the missing elements, and the combination of the cited references render the instant claimed invention obvious, as discussed in details above.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sue Liu whose telephone number is 571-272-5539. The examiner can normally be reached on M-F 9am-3pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Low can be reached at 571-272-0951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/SUE LIU/
Primary Examiner, Art Unit 1639
6/29/09